REMARKS

Claims 1, 3-10, 12-19, and 21-32 are in this application.

Claims 1, 5-7, 10, 14, 15, 18, 19, 21, and 22 have been amended to overcome objections, rejections under 35 USC 112, second paragraph, and/or to make clerical and typographical corrections.

Claims 2, 11 and 20 have been cancelled.

Claim 30 has been amended to properly reflect the preferable temperatures of induction as stated in original claim 12.

Therefore, the claim objections are moot as are the rejections under 35 USC 112, second paragraph.

Claims 1, 6-8, 10, 12-17, 19, 21-24, 28, and 30-32 are rejected under 35 USC 103(a) as being unpatentable over Mishra et al (Plant Cell, Tissue and Organ Culture 73:21-35, 2003) in view of Dasgupta et al (US 2005/0235377 A1). Claims 3-4, 9, 18, and 25 are rejected under 35 USC 103(a) as being unpatentable over Mishra et al in view of Dasgupta et al and Gupta et al (Plant Cell, Tissue and Organ Culture 51:149-152, 1997). As explained below, these rejections are respectfully traversed.

No combination of these references teach or make obvious the claimed process. The instant invention relates to synchronized regeneration of cotton plants using tissue culture techniques (see ¶0008, ¶0010, ¶0019, ¶0022, ¶0091, ¶0109, and Table 10).

To establish a *prima facie* case of obviousness, three basic criteria must be met. See MPEP 706.02(j). First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of

success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not be based on applicant's disclosure.

The references cited by the Examiner do not set forth even a *prima facie* case of obviousness for the invention as claimed at least for the following reasons.

There is no suggestion or motivation in the references or in the art to combine Mishra et al with Dasgupta because the asynchronous embryonic development described in Mishra teaches away from the substantially synchronized development of the present invention. In Mishra, seedlings and cultured hypocotyl explants thereof were used to induce callus formation for somatic embryogenesis. Development was asynchronous, producing embryos at different stages (see pages 25, 29, and 32). Since Mishra teaches a feature and result directly contrary to those of claim 1 and the dependent claims thereof, there would be no motivation for a person having ordinary skill in the art to utilize that reference in conceiving the present invention.

Also, Dasgupta does not provide a motivation to utilize inositol deprivation as in the present invention. The short-term inositol starvation of the present invention not only synchronized the embryotic development, but also increased the number of embryos recovered surprisingly by 4-5 times (see pages 9-10 of the description). There was no suggestion in Dasgupta that inositol deprivation would lead to synchronized development or a greater quantity of plants than if culturing had been on inositol-rich media. As acknowledged by the examiner, Mishra does not teach inositol deprivation. Thus, the use of inositol deprivation to synchronize development in somatic embryogeneis is an unexpected and fruitful achievement.

Even if a suggestion or motivation to combine Mishra with Dasgupta could be found, the combination could not provide a reasonable expectation of success because there was no teaching

that inositol deprivation at a particular stage would lead to synchronized embryonic development. Dasgupta teaches a method of generating transgenic plants with improved abiotic stress tolerance. Immature embryos or immature seeds were placed on a series of media lacking inositol until calli were cultured, selected, and eventually transferred onto inositol-rich medium (see Table 3, showing the composition of various media employed at different stages of the patented process). Dasgupta neither described as his objective nor reported that inositol starvation produced increased embryogenesis and/or synchronization of embryonic development as in the present invention.

Furthermore, no success could reasonably be expected in applying the teachings of Dasgupta because that reference employed inositol starvation at a different stage of development than in the present invention. The present invention cultures explants and calli and selects subcultured embryonic clumps in inositol-rich media before transfer to the inositol-free medium. In Dasgupta, immature embryos, immature seed, and calli were starved of inositol *ab initio* (see ¶0125 and table 3). Each of the media used until regeneration - MSAg, CC-1, CC-2, Delay, and Selection - lacked myo-inositol, which was included only in the regeneration medium to which selected calli were transferred until plants were formed. The development of embryos that have been deprived of inositol *ab initio* may be unpredictable, while deprivation at the prescribed stage of the present invention results in substantially synchronized development. Hence, a person having ordinary skill in the art would not have had a reasonable expectation that the proposed combination of references would successfully result in the synchronization of the present invention.

Even if a suggestion or motivation to combine the references provided a person having ordinary skill in the art with a reasonable expectation of success, the combination would not teach or suggest all of the claim limitations of the present invention. As stated above, neither reference provides the feature of synchronized development. Additionally, neither suggests inositol deprivation at the same stage of development or for short duration.

The present invention claims a method in which plant embryos are deprived of inositol at a particular stage of development (see Claim 1(v)). As the specification describes, the stage at which inositol is removed is relevant to the synchronization of development (¶0008, ¶0109). Neither Mishra nor Dasgupta taught initial provision of inositol followed by inositol withdrawal and subsequent renewed provision of inositol at particular stages as defined in the claims of this application. Therefore, the combined references do not teach all of the claim limitations.

Neither reference addresses the claim limitation that deprivation be for short duration. Claim 1 claims inositol deprivation for short duration. Dependent claim 24 further claims a duration between 8 and 12 days. The examiner argues that the interval of 7-10 days in which calli were cultured on selection medium without inositol in the Dasgupta reference provides the claimed feature. As stated above, Dasgupta starves the embryos of inositol for a continuous period *ab initio* until regeneration. The 7-10 day selection period to which the examiner referred is merely a subdivision of the continuous inositol-free period, which endures for more than twice as long (see ¶0123 and ¶0125, describing three days of co-cultivation on CC-2 medium, followed by one week on delay medium, and subsequently seven to ten days on selection medium). Thus, Dasgupta does not provide the feature of short duration.

Silent as to increased somatic embryogenesis and the synchronization of embryologic development by inositol deprivation, the cited reference when combined with Mishra could not render the present invention obvious. Neither Mishra nor Dasgupta teach increased somatic embryogenesis and/or synchronized embryologic development resulting from short-term inositol deprivation, the absence of these important elements defeating the obviousness rejection.

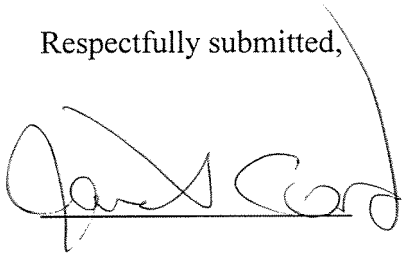
Since Mishra and Dasgupta do not render claim 1 or its dependents obvious, the additional citation to Gupta for the seed scorching feature is irrelevant. Gupta discloses a method of cotton

regeneration which employs myo-inositol (See page 149, column 2), and does not consider inositol deprivation as a means of improved somatic embryogenesis and synchronized embryonic development. As discussed above, Mishra and Dasgupta did not provide a suggestion or motivation to combine the references, a reasonable expectation of success, or all of the claim elements. As Gupta does not add any of these components, it cannot establish *prima facie* obviousness.

None of the three references, individually or in combination, teach or guide towards increased somatic embryogenesis and/or synchronized embryonic development through inositol starvation. Therefore, based on the above, there is no combination of these references that would lead one skilled in the art to the claimed process. Accordingly, it is respectfully requested that these rejections be withdrawn.

Applicants respectfully submit that the application is now in allowable form. An early notice of allowance is earnestly solicited and is believed to be fully warranted.

Respectfully submitted,



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